FAA GENERAL AVIATION NEWS

MARCH 1978

A FLIGHT STANDARDS SAFETY PUBLICATION FOR AIRMEN

Getting it all Together

FAA GENERAL AVIATION NEWS

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GO-AROUND!

Why aborted landings sometimes lead to off-airport crashes

March, being the month of contrary winds, is a period when your crosswind landing technique may be severely tested. It is also a time when your ability to make a safe go-around may come into question. Go-arounds are commonly thought of as routine procedures, but this concept is offset by accident figures which show that over 200 general aviation accidents each year occur during an attempted go-around or missed approach. (A missed approach is a go-around carried out under instrument flight rules.)

Interestingly enough, the bulk of these accidents are not happening to student pilots, as some may suppose. A compilation by the National Transportation Safety Board of 216 go-around accidents occurring in 1976 showed that student pilots, who make up about one-fourth of all active pilots, were involved in only 42 of these accidents (19%). The great majority of the pilots involved held private pilot, commercial or ATP certificates—some with over 10,000 hours of flight time. In terms of experience, the most conspicuous bracket was the private pilot with 100-500 hours.

These figures suggest that many experienced pilots never practice the go-around procedure—perhaps on the assumption that an aborted landing is the consequence of a poor approach, which in turn is due to insufficient experience or skill. But this is not true. Many go-arounds are caused by "outside" elements, such as obstacles or traffic on the runway, or mechanical failure.

The go-around procedure is not a difficult one, but it is classified in FAA's Flight Training Handbook as an *emergency procedure*, and that phrase may be the key to the problem. In an emergency the proper actions must be taken positively and in the appropriate sequence. When an aircraft is close in on final approach, and its airspeed is diminishing, controllability becomes limited and there is very little margin for error. Hesitation or confusion can have fatal consequences when seconds count, as they did in the following accident which occurred last year on Long Island, N.Y.

A pilot on the ground first observed the aircraft, a Cessna 172, as it was making a shallow base turn to Runway 36 for a landing at the small general aviation airport. On final approach the aircraft crossed over the runway threshold at an altitude estimated by the witness as 400 to 450 feet. The pilot of the 172 then commenced a go-around, increasing power but not going to full power at this time according to the witness. The aircraft maintained a shallow nose-up attitude until it had traveled over approximately three-fourths of the runway (runway length, 4,200 feet), at which point full power was apparently applied. Attitude and altitude remained constant and full flaps (40°) were maintained throughout. The aircraft disappeared from this witness' view after making a crosswind turn over the northern end of the airport.

Another witness who observed the attempted go-around was seated in his own aircraft on the ground. When he saw the 172 it was at an estimated 150-200 feet above the ground, in a nose-high attitude and descending. The aircraft continued to descend while heading in a southwesterly direction, with no apparent change in attitude, until it vanished behind some trees. The witness had the impression the aircraft was in a stall and appeared to be "wallow-

ing much like a falling leaf."

The airplane crashed in a wooded suburban area and burned. The pilot and his wife, the only persons on board, were fatally injured. An investigation by the National Transportation Safety Board disclosed no evidence of mechanical malfunction. The pilot was properly certificated and current in the aircraft. Nevertheless, his failure to accomplish the go-around safely indicated a lack of familiarity with the three cardinal principles of this procedure: *Power, Attitude,* and *Configuration.*

Power is the pilot's first concern. The instant he decides to go around, full or takeoff power must be applied and held until flying speed and controllability is restored. Adding "some" or partial power is inviting trouble. Carburetor heat should be turned off, for maximum power.

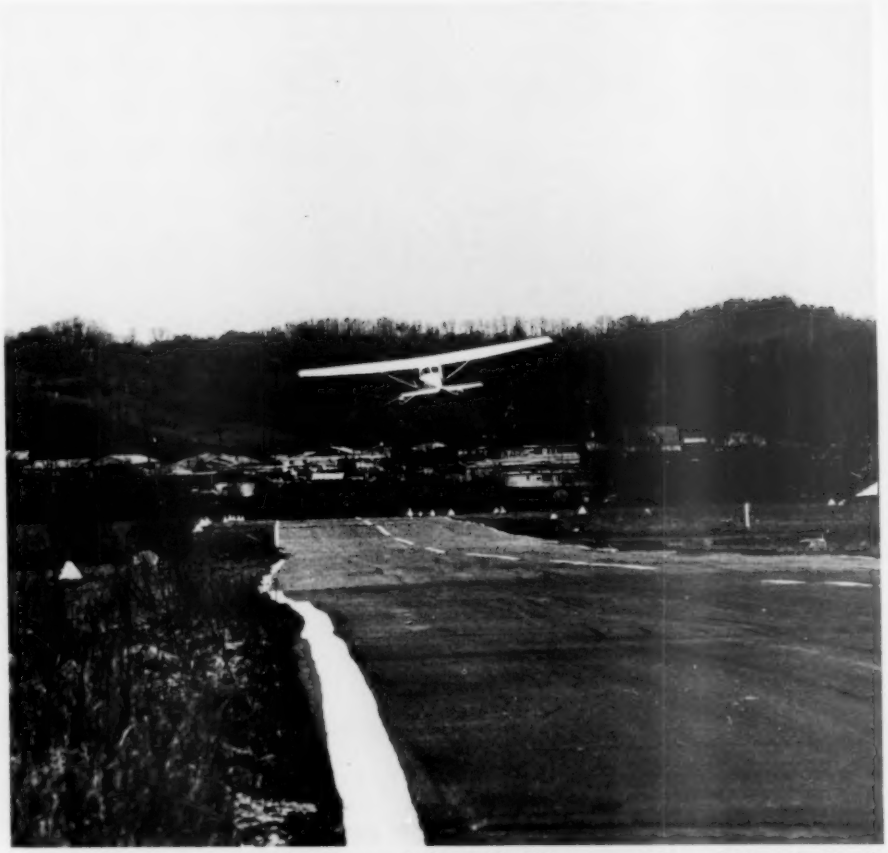
The unwillingness of some pilots to go immediately to full power at the onset of a go-around is difficult to explain. Perhaps in some cases there is still a belief that the landing may be completed without resorting to a second approach. In other words, the pilot is not fully committed to go around. Hesitation or procrastination close to the ground is always dangerous, since some additional loss of altitude is inevitable.

In other cases the pilot may simply not be aware of the degree of inertia that must be overcome, before an aircraft that is settling toward the ground can regain sufficient airspeed to become fully controllable and capable of turning safely or climbing.

Just how close to the ground you can come in any given airplane and still abort the landing safely varies from one plane to another, and from one pilot to another as well; in many instances it must be experienced (under simulated conditions) to be believed. In the tension created by the go-around emergency, an inexperienced pilot, in his concern for the position of other aircraft in the pattern or on the ground, may fail to notice that he is continuing to lose altitude or airspeed, as a consequence of failing to go to full power.

Application of power should be smooth as well as positive. A jerky movement of the throttle in some aircraft will cause the engine to falter, costing the pilot several precious seconds of power loss. Carburetor type engines are more susceptible in this respect than fuel-injected engines.

Attitude is always critical close to the ground, and when power is added, a deliberate effort on the part of the pilot will be required to keep the nose from pitching up prematurely. The aircraft executing a go-around must be maintained in an attitude which permits a buildup of airspeed well beyond the stall point before any effort is made to gain altitude, or to execute a turn. Raising the nose too early may produce a stall from which the airplane could not be



Aircraft making a go-around should move to the right of the runway (if in a left-hand pattern). Common mistakes are forgetting to close off carburetor heat or to retract flaps.

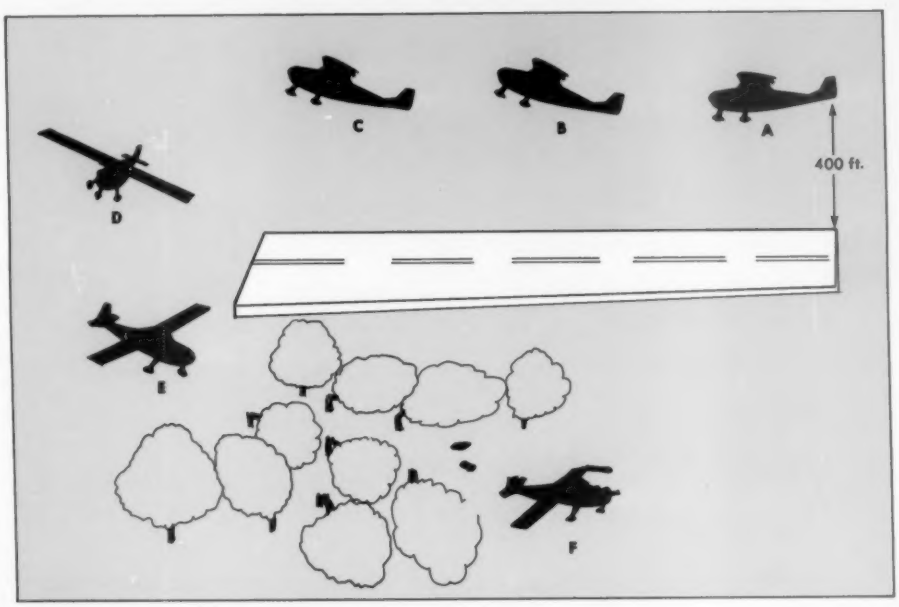


DIAGRAM OF AN ACCIDENT

A. Plane arrives too high over threshold, pilot decides to go-around. B. Pilot increases power to cruise rpm, allows nose to pitch up. Aircraft fails to climb or increase speed. C. Pilot applies full power, but does not reduce flap setting. D. Aircraft stalls as turn is initiated in nose-high attitude. E. Plane sinks rapidly and plunges into trees. F. Crash site.

When the approach is too low, pilot has the option of adding enough power to complete the landing or of going to take-off power for a go-around. Indecision can lead to a loss of all options.

recovered if the go-around is performed at low altitude.

A concern for quickly regaining altitude, during a go-around, produces a natural tendency to pull up the nose—especially when the runway is limited and there are obstacles to clear. The pilot who aborts a landing must accept the fact that a plane will not climb until it can fly, and it will not fly below stall speed. In some circumstances it may be desirable to lower the nose briefly, to trade off altitude for airspeed as the go-around is begun. As soon as best rate of climb speed is attained, the aircraft should be trimmed for that attitude.

Configuration. In cleaning up the aircraft during the go-around, the pilot should concern himself first with the *flaps* and secondly with the *gear* (if retractable), since the drag induced by flaps is much more serious. Aircraft are designed to be able to climb, even with the flaps fully extended, at sea level. However, if the go-around is begun just above stall speed, or in high density altitude conditions, more thrust than is available may be required to accelerate to climb speed.

Performance varies of course, but in general, retracting the flaps to the halfway point decreases the drag a relatively greater amount than it decreases lift.

Some pilots hesitate to reduce flaps because they are afraid of losing altitude which they cannot spare. However, if the airplane is flown correctly, at a speed greater than the flaps-up stalling speed, flaps may be retracted without losing altitude. Flaps should always be reduced in stages (if manually controlled), to avoid an overly abrupt loss of lift or possible stall. The pilot should be governed by the recommendations of his airplane flight manual, which may differ importantly from one airplane to another.

In a recent accident at Yucca Valley Airport in California, the pilot of a *Cherokee* bounced hard on his landing attempt on Runway 6. According to the pilot and a witness on the ground, full power was applied in an effort to go-around. The aircraft moved down the left side of the runway in a semi-stalled condition at an altitude of approximately 30 feet above the ground for 350 feet before descending and crashing into a five feet-high concrete wall. The pilot and three passengers received only minor injuries, although the impact tore away the engine and severely damaged the airplane.

During the investigation, the pilot stated that he had attempted the landing with full (40°) flaps, and he thought that he had used 20° flaps during the go-around attempt. However, all witnesses on the ground agreed that the flaps appeared to be in the full down position at all times until the crash.

Torque is a factor all pilots are aware of on takeoff, and counter pressure with the rudder is normally a routine matter. But some pilots forget about torque when executing a go-round, and the consequences can be serious. In a recent accident near Louisville, Ky., the pilot of an American *Yankee* was making a landing at a private 2,500 airstrip and was on the point of touching down at midstrip when he decided to go-around. The aircraft left the ground and gained altitude but drifted off the runway to the left. The pilot was unable to avoid striking a telephone pole located approximately 100 feet to the left of the departure end of the runway.

Impact tore off part of the wing and the airplane crashed, killing the pilot and severely injuring his passenger. An investigation disclosed no malfunction that could have contributed to the accident, and it was presumed that the pilot had failed to compensate for the torque he experienced after adding full power.

Perhaps even more difficult than the physical obstacles which may be encountered on an go-around are the mental or emotional setbacks that often occur when the emergency is real. Some pilots tend to freeze on the controls, until past the point when a successful go-around is possible. Others attempt to "horse" the aircraft off the ground or bank excessively, lose control and stall. Some simply forget to carry cut a critical function, like easing off flaps. Costly mistakes of this kind can be avoided by regularly practicing the procedure—under safe circumstances, where there is no traffic conflict, and preferably under the eye of an experienced instructor. It might be a piece of cake for you, or it might give you a good healthy scare.

Either way, you'll be ready for the unexpected.

1976 Go Around Accidents

By Certificate

Pilots in Accidents		All Pilots	
Student	42 (19%)	187,200	(26%)
Private	113 (53%)	309,005	(42%)
Commercial	51 (23%)	187,801	(26%)
ATP	7 (3%)	45,072	(6%)
	*213	729,078	

*(Three had no certificate)

By Experience

Less than 50 hours	32
50-100	31
100-500	80
500-1000	21
1000-20000	27
2000-5000	16
5000+	9
	216

(Editor's note: accidents described in this magazine are based on investigations conducted by the National Transportation Safety Board. Some details are altered to protect privacy.)

VRS

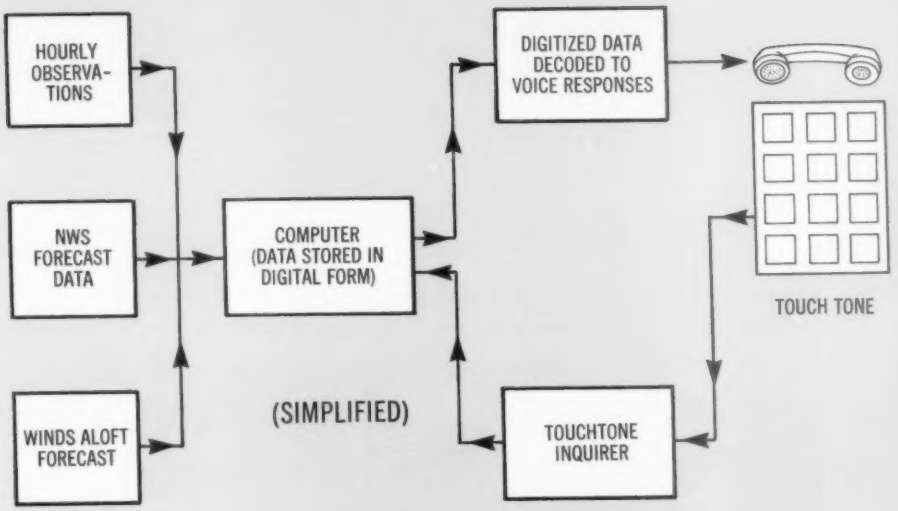


Figure 1 ↑

A talking computer could become the pilots best friend

Beginning on or about April 1, 1978, FAA will conduct the first public demonstration of VRS, a computer-controlled Voice Response System for making FSS weather data more readily available to pilots. Over the next four months pilots flying out of the Washington, D.C., area will be encouraged to get a preliminary weather briefing tailored to their own needs from the "talking computer" via a standard pushbutton telephone before leaving their home or office.

The VRS system is composed of four major components: *Processor, fixed head disc, pushbutton decoding* and *speech decoding equipment*. The processor is a PDP-11/34 mini-computer; it performs the functions of interpreting the telephone inputs from the pilots, determining what weather information has been requested, requesting this information from a developmental PDP 11-70 weather data base computer and converting this information into speech by stringing together prestored words and phrases into the appropriate output message.

The fixed disk is used to store previously digitized spoken words and phrases, after these are converted from analog to digital form.

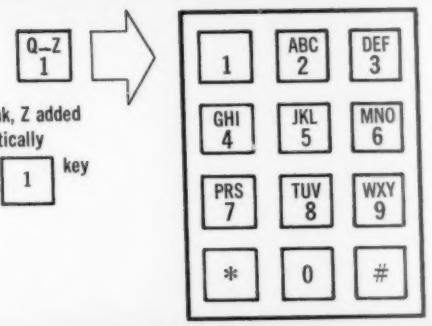
Retrieval of the data stored on the disk is performed by the speech decoding hardware, which converts it into conventional "analog" speech that can be routed to the telephone input channel.

The telephone decoding equipment, consisting of 20 independent decoding channels, decodes the pushbutton inputs from the telephone and routes these messages to the computer.

USING THE VRS

Figure 2 ↓

Call 347-3222 in the Washington DC area



WHEN ENTERING DATA

LETTERS	PRESS KEY CONTAINING LETTER, FOLLOWED BY KEY [1] [2] or [3] TO INDICATE WHETHER LETTER IS 1ST, 2ND, or 3RD ON KEY.
NUMBERS	PRESS KEY CONTAINING NUMBER (SINGLE STROKE ONLY) or [0] FOLLOWED BY KEY CONTAINING NUMBER (USED ONLY ON MIXED ALPHA-NUMERIC DATA)

USER CONTROLS

[*] [*]	STOP (STOP VRS DURING SPEAKING)
[*] [4]	GO (START VRS AFTER STOPPING)
[*] [7]	REPEAT LAST VRS MESSAGE
[*] [5]	JUMP AHEAD (GO TO NEXT ENTRY)
[*] [3]	DELETE LAST OR CURRENT ENTRY
[*] [2]	GO BACK TO BEGINNING OF BRIEFING
[#] [#]	PERIOD (DATA ENTERED)

The pilot will "converse" with the automatic briefer by pressing the keys of a "Touchtone"® type of telephone, eliciting voiced queries and responses scarcely distinguishable from a "live" briefing, and providing FSS weather data updated directly from the Weather Message Switching Center at Kansas City. Developed by DOT's Transportation System Center and by FAA Research and Development Service, the system will provide three kinds of weather information: *hourly surface observations, terminal forecasts,* and *forecast winds aloft.* These products are intended to provide the pilot with data for a preliminary flight planning decision. NOTE: *VRS will not contain all of the weather and flight data available for complete preflight planning, and is not intended to completely replace an FSS specialist briefing.*

Operating Procedures

Any public, business, or home telephone with a standard 12-key pushbutton signaling system may be used to contact the system. An acoustically-coupled tone signalling device, in lieu of a "Touchtone"® telephone, may be used with the conventional rotary dial telephone to enter information requests.

The Voice Response System access number will be 347-3222, a toll-free call in the greater Washington metropolitan area. Otherwise, it will be a standard toll call into the 347 exchange area.

Upon contacting VRS, the pilot will be prompted by the computer to enter "location indentifiers" of interest. These are three-letter symbols which identify the weather reporting and forecasting stations of interest to the pilot along his proposed flight path. (Three-letter identifiers are readily available from AIM, Part 2.)

Printed on most keys of the "Touchtone"® pad are three letters and a number. To enter a letter, two keystrokes are required. First the pilot presses the key that contains the desired letter, then either the 1, 2 or 3 key to indicate if the desired letter is the first, second or third letter shown on the key. For example, the letter C is signalled by depressing the key on which "C" appears and the numeral "3" key. Thus, DCA is entered as D, 1; C, 3; A, 1 (Figure 3).

Some location identifiers use the letters Q or Z, which do not appear on 12-key pushbutton pads. The VRS assigns these letters to the number 1 key (theoretically) in the sequence of Q, Blank, Z. Therefore Q would be keyed as 1, 1; and Z as 1, 3. The blank or second position is not used.

After each location identifier has been entered, the # key is pressed twice. #, # always tells the computer that your entry is complete. Yes and No answers asked by the computer are answered simply "Y" or "N" (Y or N key, plus ##). Other key responses (see figure 2) will instruct the computer to stop, go-on, skip ahead, delete, repeat, begin over, etc.

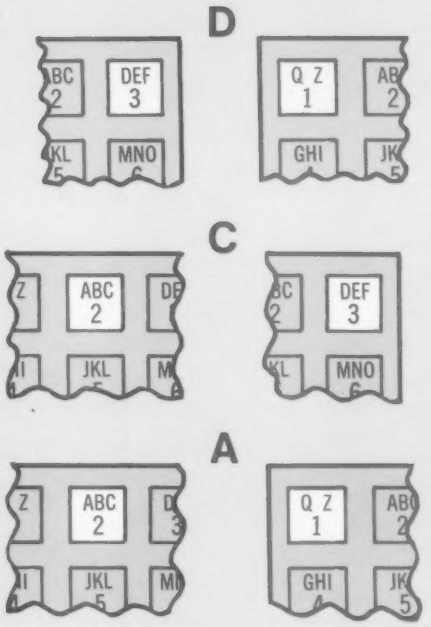


Figure 3

Computer readback provides an accuracy check for each item entered. As each identifier is entered, a readback will be spoken, usually in the phonetic language. For a few locations, the actual name of the airport will be given. DCA, for example, will be voiced as "Washington National," instead of "DELTA CHARLIE ALPHA."

After the pilot has listed all desired locations, the computer will ask whether he wishes hourly surface observations, and terminal forecasts, and/or winds aloft data, and for which altitudes and time periods. Time and altitude responses, being numerical only, are entered with a *single* keystroke, pressing the appropriately numbered key, plus #, # to signify the entry is complete.

Finally the computer will ask the pilot if he needs further information. If yes, the pilot enters more location identifiers.

Data Not Available

When data are not available, one of the following will occur:

1. Wrong Identifier: If a three-character entry which does not constitute a valid location identifier is made (e.g., ABC), the VRS will say "ALPHA BRAVO CHARLIE . . . is not a location identifier."

2. No Report for a Given Location: If the location identifier is a valid one but not a reporting station for the type of report requested, the VRS will say "ALPHA BRAVO CHARLIE . . . is not an hourly observation station" or ". . . is not a terminal forecast location."

3. Noncurrent Data: If the location identifier is a valid one but the current data are not available, the VRS will say (e.g., SBY), SIERRA BRAVO YANKEE . . . report not available for report type requested.

NOTE: All reporting stations for weather observations within the continental United States are contained in the data base. However, only the latest available observation will be given (not more than two hours old).

A Typical VRS Dialogue

PILOT—Dials 347-3222

VRS—"HELLO, CURRENT GREENWICH TIME IS XXXX. ENTER LOCATION IDENTIFIER."
PILOT—(Desires Pittsburgh—PIT) P, 1; I, 3; T, 1; #, #

VRS—"PAPA INDIA TANGO. ENTER NEXT LOCATION."
PILOT—(Desired location—ILG) I, 3; L, 3; G, 1; #, #

VRS—"INDIA LIMA GOLF. ENTER NEXT LOCATION."
PILOT—(If no additional entries, enters #, #)

VRS—"DO YOU WANT HOURLY SURFACE OBSERVATIONS? ANSWER YES OR NO."
PILOT—Y; #, #

VRS—Reads hourly for PIT, ILG, etc. Then asks, "DO YOU WANT TERMINAL FORECASTS? ANSWER YES OR NO."
PILOT—Y; #, #

VRS—Reads forecast for PIT and ILG. Then asks, "DO YOU WANT FORECAST WINDS ALOFT? ANSWER YES OR NO."
PILOT—Y; #, #

VRS—"HOW MANY HOURS FROM NOW, (Maximum, 30 hours.)
PILOT—6; #, #

VRS—"SIX. AT WHAT ALTITUDE?"
PILOT—85; (or 8500) #, #

VRS—"EIGHT FIVE." Reads winds aloft at requested altitude, +4000 feet and -4000 feet for each location. Then asks, "DO YOU WANT MORE INFORMATION? ANSWER YES OR NO."
PILOT—Y; #, #

VRS—"ENTER LOCATION IDENTIFIER," etc.

All pilots are encouraged to participate in this trial demonstration, which will operate daily from 6:00 a.m. to 8:00 p.m. local time. VRS is not yet fully equipped with redundancy for extended operations and there will be periods when outages occur.

Detailed information on the Voice Response System is being mailed to nearly 9,000 pilots registered in Washington, D.C., and the surrounding counties. Any interested pilot living outside this area or any local pilot who does not receive a notice of the demonstration may obtain one by mailing a self-addressed and stamped request to: VRS, DOT/FAA/NAFEC, ANA-250, Atlantic City, NJ 08405 ■

Rotors in the Snow

Flame-out from turbine snow intake is one of the problems of flying a helicopter in winter

The flight began on a cold, blustery day in March. The visibility was good, under a 6,000 feet overcast, when the pilot and his two passengers boarded the Hughes 500 helicopter. They departed Juneau, Alaska, at approximately 12:30 p.m. local time, bound for Ketchikan, some 220 miles to the south, at the tip of the Alaskan panhandle. The pilot, a mining engineer, intended to inspect several of his mining camps en route. His passengers were a married couple who were going to visit relatives in Ketchikan. There is no record of the pilot having received a weather briefing prior to takeoff. Pilot reports on the weather at midday spoke of light turbulence and snow in the southern portion of the route, with visibility one to two miles. No flight plan was filed.

About 50 minutes out of Juneau, when the Hughes 500 was some 20 miles north of Petersburg (the halfway point for this flight), a snow squall was encountered. The pilot reduced speed, brought the helicopter down close to the treetops and followed the island (Kupreanof) shoreline until reaching the outskirts of Petersburg. He reassured his passengers by telling them that he did not consider snow flurries or squalls a serious hazard in this type of aircraft, since it could be put down at virtually any point on the shore.

He added that the 500 was equipped with an "automatic re-start" unit that would immediately re-start the engine if for some reason they experienced a flame-out. At this point he switched on the unit.

By the time they reached Petersburg, the town was being pelted by a "fairly heavy" snow squall. To clear any possible airport traffic in the area the pilot took the helicopter up to approximately 1,000 feet and continued on down the channel. They were now flying through fairly heavy snow although the shore was in sight.

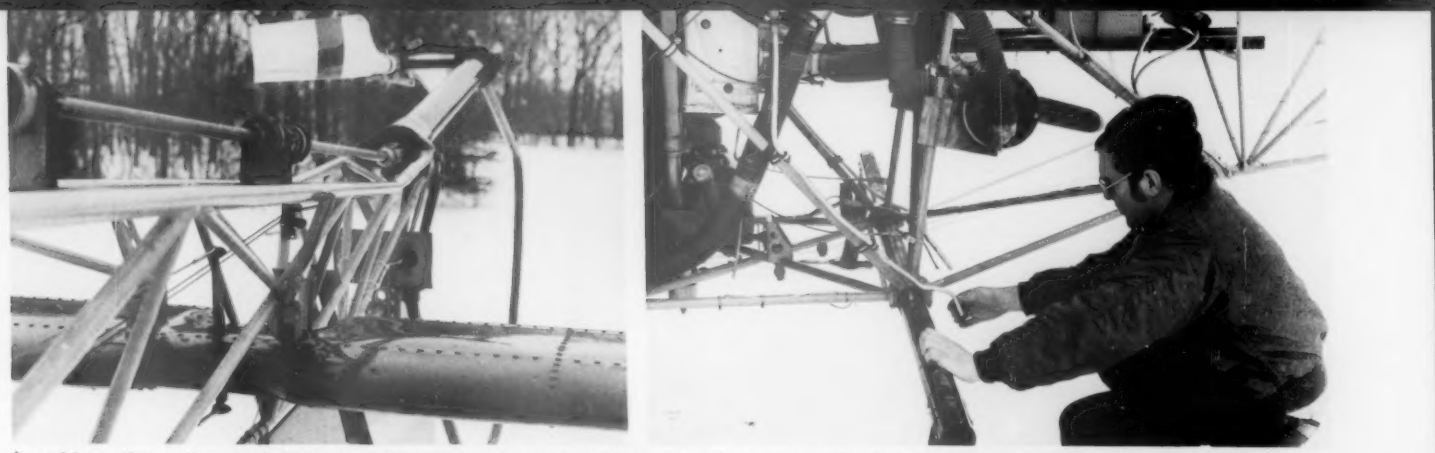
Approximately 15 minutes out of Petersburg the engine stopped abruptly. According to the statement of the surviving male passenger, the helicopter first "sort of skidded to the left," as the nose pitched up and then down. The controls began to move back and forth violently and there was a loud "whap-whap-whap of the rotors above us." Then the 'copter fell off to the left, entered a dive and crashed into the water.

The survivor was knocked out by the impact. He regained his senses to find himself under water, entangled in the wreckage. He struggled free and came to the surface, pulling himself up by means of what appeared to be the landing skid, which was inverted. He then located the rear door of the submerged cabin, made his way inside and felt around in the darkness for other survivors. Finding no one, he returned to the surface and almost immediately lost contact with the wrecked aircraft.

After getting no response to his frantic calls for help, he saw a "dark haze" which he took to be the shoreline, and began swimming toward it. The frigid water numbed his body and he could feel the tide pulling against him, but he managed to reach a shallow beach and stumble up on the shore.

He thought he heard an airplane flying low over the channel, but was unable to see anything because of the blowing snow. Then he heard an outboard motor offshore, and presently a boat came in sight and responded to his shouts. He was taken to a miner's cabin and cared for until picked up by the Coast Guard helicopter and flown to the hospital in Petersburg. His wife and the pilot did not survive the crash. The ELT did not function under water.

The investigation conducted by FAA for the National Transportation Safety Board did not disclose any evidence of aircraft malfunction or pilot disqualification that would have any bearing on



In cold weather a "see and feel" inspection must be made of all exposed parts—including the entire surface of the rotor blades. On small helicopters, ice from snow melt can obstruct control linkage or fuel and oil lines. Patience—and warm clothing—are in order.

the accident. The NTSB concluded that "powerplant failure for undetermined reasons" was the probable cause of the accident, and listed as factors "lack of familiarity with the aircraft," "improper emergency procedures," and "possible snow ingestion."

The great versatility of the helicopter in wintry or snowy conditions that ground most light, fixed-wing aircraft has led to their increased use, for business and pleasure as well as for emergencies, especially in the northern and mountainous states. Not all designs, however, are approved for operations in snow because of the susceptibility of the turbine engine (which powers most helicopters built in recent years) to flame out from excessive water or snow ingestion. The "automatic re-start" system referred to in the accident near Petersburg is an emergency or igniter unit which, in the "on" position provides only a means of ignition, not rotation. In most cases where the flame out condition is extended to the point where spool down occurs, the turbine must be cranked back to a "come-in" rpm by means of the normal startup procedure, since the windmilling rotor will not induce movement in a free turbine engine. Following a flameout due to ingested snow, the pilot must institute autorotation and maintain control of the aircraft (often in turbulent conditions) while going through his startup procedure. In some cases, he has been unable to do so in time to avert a crash.

Automatic re-ignition units or kits are usually offered as an optional item on turbine-powered helicopters, which otherwise may not be approved for operation in falling snow. Such limitations are given in the aircraft flight manual. Failure to observe these limitations led to another flame-out accident in Kentucky.

West Virginia to Kentucky

The 'copter departed Dunbar, W. Va., (a suburb of Charleston) at 11:30 a.m. on March 3, 1975. The intention of the pilot was to fly to London, Ky., by way of Huntington, W. Va., and Lexington, Ky. He was accompanied by two passengers.

The weather outlook was not good. At 10:30 a.m. local time, one hour before departure, the reported weather at Charleston was: *Obscuration 1000 feet, visibility one-half mile, light snow, fog.* Huntington was reporting: *Ceiling indefinite 700 feet, visibility five-eighths of a mile, light snow.* Lexington had *300 feet overcast, one-half mile visibility, light snow.*

(The pilot later stated that his estimate of the local weather was ceiling 1,500 feet, visibility three miles, snow.)

After taking off from Dunbar the helicopter headed west over Interstate Highway 64, avoiding hilly terrain and staying low over the highway. Approximately 30 miles northeast of Lexington, in the vicinity of Mt. Sterling, Ky., the pilot reported encountering light snow showers. Six miles east of Mt. Sterling, just as the aircraft emerged from a snow shower, the engine flamed out. The pilot autorotated to a landing on the median strip of I-64. After touching down on uneven ground the helicopter tilted to one side,

The helicopter has become the "Florence Nightingale" of the north: injured skier, above, is put aboard Bell JetRanger at Lake Tahoe.

causing the rotor blades to strike the ground. There was considerable aircraft damage, but no serious injuries to the pilot or passengers.

An investigation confirmed the absence of an automatic re-ignition unit on aircraft. There was no evidence of mechanical failure which could have led to engine failure, other than snow ingestion.

Some helicopter engines are equipped with a "particle separator," a device for preventing snow or ice from entering the turbine intake in large clumps. However, the protective capacity of this type of equipment is only relative, depending on the intensity of the snow-fall and the duration of the flight—as the pilot of a Bell 206B discovered during a winter afternoon flight from Oxford-Waterbury Airport in Connecticut to New Rochells, N.Y.

Flying the Iron Compass

According to the pilot's statement to investigators, he encountered snow showers soon after taking off, but was able to maintain one-half mile or better visibility by flying at 400 feet above the ground, following the Penn-Central railroad right-of-way.

As the aircraft was approaching New Rochelle the engine flamed out without warning. The pilot selected a car parking lot for his emergency landing field. He was obliged to make his approach downwind and touched down hard, with less than optimum rotor rpm. There were no injuries and only minor damage to the helicopter and a parked car. The pilot noted that the flight had lasted only about 25 minutes, considerably less than the allowable limit of 1.5 hours of flight time approved with the particle separator. He recommended that the particle separator be used in conjunction with an automatic re-ignition system, which had not been installed on this aircraft.

The degree of snow ingestion into a helicopter jet engine can be controlled to some extent by careful piloting. *Hovering over loose snow is to be avoided whenever possible.* In loose snow conditions a positive rate of climb and forward speed should be attained immediately after lift-off. A normal approach for landing on snow should be *one continuous operation* to the ground without hovering. Unnecessary hovering could cause loss of control from spatial disorientation, as well as possibly resulting in an engine flameout. If the landing area or reference point should start to become obscure during the landing, an immediate climb-out should be undertaken—rather than an ill-advised attempt to hover and become re-oriented.

Veteran pilots who fly the Alaskan pipeline in extremely cold and snowy conditions have a number of recommendations to offer in regard to helicopter safety. (Some aircraft are restricted against operating in below zero degree temperatures—check your flight manual.)

As with all types of aircraft, flight safety begins with a conscientious examination of the airframe and engine before entering the cockpit. With small helicopters much of the airframe, the engine and the control system is exposed to the weather. Exposed metals may become brittle; careful attention should be paid to all stress areas where cracks might develop. All openings should be inspected to insure that snow has not packed around the control tubes, rotating parts, and cables. The tail rotor cables should be checked for the proper tension, and the cable pulleys examined for ice which could cause the cable to jump the pulley.

Oil reservoirs should be checked more frequently in cold weather, and not topped off until after runup. Many pilots like to walk the main rotor blades around prior to starting, paying particular attention to any dragging noise which might indicate a bearing seizure. This practice also relieves stress on components caused by cold-thickened lubricants, during start-up.

Easy with the Switches

While the aircraft interior is still very cold, all switches should be moved very carefully to avoid damage, as these parts too become brittle in frigid air. When checking the controls, small, easy movements will place minimum stress on the linkage, and prevent damage. During ground runup the rpm should be increased slowly, to maintain oil pressure within operating limits. If the oil breather tube freezes up, rupture of the seals may take place. Some operators drill a small hole in the tube to make sure of pressure equalization—this modification should be approved by the Flight Standards District Office.

Helicopters that are parked outside in the winter must be gone over carefully for surface ice buildup, especially on the main and tail rotors. The danger is not only from the loss of lift brought about by the ice, but also from the weight imbalance. On some craft an area of ice no larger than a fifty cent piece could cause enough vibration to disrupt a flight, or even cause the aircraft to flip over on takeoff.

Radios should not be tuned prior to starting in very cold weather. After the aircraft electrical power has been stabilized, the radios should be turned on and allowed to warm up for five or ten minutes before tuning to the desired frequency. If they are tuned before warmup, the mechanical tuning mechanism may cause electronic damage.

As a precaution against ice buildup during flight, the pilot should make certain that the pitot heater, the windshield defroster and the cabin heater are functioning. Very cold air is usually also very dry, but it takes only a touch of fog to enshroud the cabin with ice.

Helicopters have performed heroically under incredible snowy and Arctic conditions. They have plucked survivors from mountain tops and out of swirling blizzards. They may be flown just as safely in the winter as at any other season, as long as the operator abides by the limitations of his flight manual and takes good care of his machine.

It is, after all, only a machine, not a magic carpet.

to 6 hours of operation per engine overhaul period and operation at the safe conditions. (See Figure 1-1.)

1-5. FLIGHT LIMITATIONS

a. Instrument flight prohibited.

b. Flight during icing conditions prohibited.

c. Maximum operating altitude; 20,000 feet.

d. Solo flight permitted from left seat only.

e. If 369H90118 Automatic Engine Reignition Kit is not installed, flight operation is prohibited in falling snow. If helicopter has been sitting out during falling snow, prior to next flight ascertain that aircraft engine inlet system and surrounding skin areas are completely free of accumulated snow and ice.

FAA Approved 13 August 1973
Hughes 500 Model 369HS Helicopter

1-5

Famous
FLYERS

Robert Fulton and his "Airphibian"

The first "roadable" airplane

On a dark winter's night in 1945, a Connecticut Yankee sat cooling his heels in a small, isolated airport in central Florida, waiting for ground transport that seemingly would never come. He had left his office toward the end of a tiring day and flown here in haste because he had a contract with the Army for a gunnery training device that needed attention, and after all there *was* a war on. But what good were the hours saved by flying down if he had to lose even more hours in getting to his actual destination? He had experienced such delays frequently over the past year, and no one seemed to have any answer to the problem. Airports were commonly located far out in the country, and often very distant from one's actual destination.

But for a man with the name of Robert Edison Fulton, Jr., every problem has its solution in the human mind. An aircraft, he reasoned, is actually a wheeled vehicle that happens to have wings. *Is there any reason why it can't travel on the ground as well as in the air?* Sure, the wings take up a lot of space, but foldable wings are standard on shipboard aircraft, and working out a "quick dismount" should not present any real difficulty.

The more he thought about it, the more convinced he was that one and the same vehicle could be used aloft or on the surface. He knew that Federal standards for aircraft structural strength far exceeded those of any automobile. No ordinary car could take the punishment an airplane absorbed when operating from rough fields, to say nothing of buffeting rough air. *What did the airplane lack?*

Power from the engine would drive wheels as well as a prop, with only slight modifications. The airplane cabin was just as comfortable and useful as the automobile body. The propeller would present a hazard on the road, and the tail could get in the way, but why not arrange to leave them behind at the airport—along with the wings?

When he returned to his factory in Connecticut and presented his idea to his colleagues, there was almost universal skepticism. Still, when you are the great, great grandson of Robert "Steamboat" Fulton, any "folly" you come up with is entitled to serious consideration. And this contemporary Fulton already had earned a reputation as an inventor who accomplished the unexpected.

Robert Edison Fulton, Jr. was born in 1909 to a family that was continuing to figure largely in America's transportation development. One uncle had founded the Greyhound Bus Company, and his father was president of Mack Trucks, Inc. Automotive shops were his childhood playground; he learned about mechanical engineering the way other children learned to play ball. In an age before automatic copiers had been invented, young Fulton earned spending money by copying mechanical drawings for his father's company, little realizing how the experience was preparing his mind for his career as a designer.

Then he was shipped off to school, first in Switzerland, then Exeter, Choate and Harvard, where he earned a Bachelor's degree in architecture. Then came graduate work in Paris and Vienna, and a tour of Europe's congenial capitals and high society. On impulse he bought a camera, hopped on a motorcycle and traveled from England to the Orient, producing enough graphic and written material for a book (One-Man Caravan). Then he settled down in Connecticut to think, invent, plan, design and build objects of use to man.

At the onset of World War II, Fulton became involved in an aircraft simulator designed by his cousin, Chet Travis. Their "Aerostructor" was one of the first pilot trainers to use actual scenery (on film) for realistic simulation of the flight environment, and tests demonstrated its value in reducing training time. Nevertheless no one in Washington showed any interest.

Exasperated, Fulton went to see an admiral of his acquaintance and announced that he could re-rig the Aerostructor to teach aerial gunnery. His argument was so convincing that he came away with a contract to build a model "Gunairstructor."

The skeptical Travis bowed out of the project, but Fulton hired an engineer and went to work in his shop in Greenwich, Conn. With a borrowed torch he learned to do the welding himself, an experience which he said changed his entire outlook on life. The small table model Gunairstructor grew bigger and bigger, culminating as

Summer time
or winter clime?
Inventor Fulton's family
could fly/drive on weekends
to the vacation of his choice.

a full-scale model which was demonstrated successfully to the Navy in 1942, and resulted in $6 million worth of orders. Fulton himself learned to fly in the process of writing a syllabus on gunnery training for all U.S. military fighter pilots.

By the end of the war Fulton had several large plants and a first-rate technical staff at his command. A new company, Continental, Inc., was formed to produce a "roadable" airplane, and work proceeded at his 50-acre factory, field and home complex at Newtown, Conn. The first step was to sift over what had already been done by others in this field. Patents had been issued, dating back almost to Kitty Hawk, for a car that would fly, or a plane that would drive. All involved some radical alteration—a tail-less or wing-less airplane, a car with three wheels, or propeller drive, etc.

Fulton saw no reason to modify proven conventional designs, placing his faith in *convertibility*. His basic requirement was that transition from road to flight configuration be simple and fail-safe, something any layman could accomplish within five minutes without special tools or skill. His first models, expected to cost $6,000 to $7,000 (1947), would accomodate two persons side by side, followed later by a four-seater. Airspeed was targeted at 110 miles for cruise, ground speed about half that.

The *Airphibian* that emerged from their drawing boards looked much like the standard highwing monoplane of the times—quite similar to a Stinson *Voyager* except for a four-wheel undercarriage, with fairings doubling as fenders. On land the rear wheels were driven by the 150 hp Franklin engine. Empty weight was 1,105 lbs. The wing and entire fuselage aft of the cabin detached, with a "convertible" top offering full or partial enclosure.

With a takeoff speed of 60 mph and climb rate of 600 fpm the *Airphibian* handled like a normal aircraft in every respect. Fuel consumption average 15.8 mpg, on the road or in the air. The cabin was 11′6″ long

and 5′ high with a 72″ wheelbase. Fulton welded many of the tubular steel joints in the first model himself.

Technical problems of building the *Airphibian*, while often complex and demanding, were soon overcome. What began to eat into their resources was the unavoidable requirement that every component of an aircraft be type certificated. This involved thousands of hours of preliminary testing, redesigning, rebuilding and retesting under supervision of the Civil Aeronautics Authority (predecessor of FAA). Thousands of pages of records and reports had to be produced, and thousands of miles of road and flight operation completed, to prove the airworthiness of every part, under every condition of possible use. Test specimens and even whole airframes were demolished in crashworthiness tests. Again and again a standard, "off the shelf" part which had previously earned a type certificate after exhaustive testing lost its certificate because it had to be modified to make it more "roadable"—and the whole certification process had to be repeated. Component manufacturers were willing to retype certificate their products with Fulton's modifications, but the cost was so high that he usually ended by doing it himself. His company's investment reached formidable proportions.

The first test flight was made on May 21, 1947, at nearby Danbury Airport. To avoid attracting a crowd of onlookers, takeoff was at night, with dozens of flashlights substituting for runway lights. With Fulton at the controls, seemingly endless taxi runs were made, slowly at first, then faster and faster. As the inventor recalled:

"The wheel felt good. The rudder responded well. The brakes were smooth. The propeller absorbed the engine's surge of power. Finally the right moment came—suddenly the headlights gleamed upward. In everyone's mind was a compressed image of busy days and sleepless nights, of hope, confidence and a healthy share of doubt. But

the Airphibian *was flying smoothly, steadily. Throttle closed, flaps down! The runway was getting short. I eased back on the wheel and the flight was over, as easily and deliberately as it had begun."*

Over the next six months the first experimental *Airphibians* flew and drove thousands of hours and miles, attracting worldwide attention. Fulton was invited to England by the London *Daily Express*, which was staging an air pageant for the benefit of disabled war veterans. Highlight of the show was a race between the *Airphibian* and two groups of news reporters who would travel by rail and car from London to Ryde, on the sea coast. By the time the first of his competitors arrived Fulton had been in Ryde for over two hours and was awash with endless cups of tea he had been drinking.

Back in the United States the *Airphibian* continued to perform without a fault, demonstrating its versatility by serving Fulton in business and pleasure matters (including alternating weekend vacations in Maine and Florida). Seemingly he had the answer to a travel-minded nation's dream.

On December 21, 1950, the aircraft type certificate was finally awarded—the first of its kind ever. At the same time Fulton obtained a signed order from the Federal Government for the first eight production models, to be used by CAA inspectors traveling around the country in pursuit of duty.

Fulton returned home expecting to be feted by his fellow company officers who, in the course of financing the *Airphibian* had become the majority stockholders. Instead he was told to take his purchase order back to Washington and get it cancelled—". . . we are not interested in building eight machines—we want to build 80,000 at least. Since we are in no position to do this, just find a buyer for the certificate." The order was cancelled and the project abandoned.

Sorely disappointed, Fulton went his own way thereafter, as a "lone wolf" inventor and designer, giving his attention primarily to emergency rescue devices for the Navy and Air Force. His most widely publicized invention of this type is the "Skyhook," a Long Range Air Rescue system using fixed-wing aircraft (mostly C-130's) for plucking downed personnel or equipment from inaccessible terrain or waters.

Today at 69 Robert Fulton is still busily inventing—and flying. His P-51 (which carries his skis in the gun mounts) is his favorite plane, but he also flies a Stinson *Reliant* from his home strip. The tower atop his home in Newtown is an isolated "think" room, complete with stone fireplaces, drawing boards and momentoes of world travel and adventure. He sometimes speculates on how life in the United States might have changed, if his *Airphibian* had survived the scalpel of financial necessity, and he hopes to see the day of its revival—at someone else's hands. For the moment it resides in the Smithsonian Air and Space Museum Washington, D. C. ■

BRIEFS

PARTS MANUFACTURER APPROVALS. The latest listing of companies holding Federal Aviation Administration approval to manufacture aviation parts is now available. Copies of the current publication, entitled "Parts Manufacturer Approvals—1977," may be ordered by sending a check for $8.50 to Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Identify the publication by title and specify stock number: 050-007-00401-0.

AN UNEXPECTED HAZARD. The Civil Air Patrol has alerted its members to the potential dangers of insecticide contamination from downed ag-planes. Recently an agricultural aircraft was applying insecticide to a soybean field near Petersburg, Va. when it crashed, killing the pilot. CAP members volunteered to guard the site overnight, and the next morning one of the members awoke feeling dizzy, nauseated and groggy. Taken to a nearby hospital, he was treated for insecticide intoxication and recovered, but in the absence of prompt diagnosis and a nearby hospital the results could have been far more serious.

Search and rescue personnel are advised to assume that any crashed ag-plane could have spilled toxic chemicals, and to keep well clear of the wreckage until properly trained technicians have neutralized any spills or leaks. A chemical-hazards hotline is available day or night to provide help on a nationally toll-free phone number: (800) 424-9300.

LOOKING FOR LEAKS. If you own or fly an airplane that has Goodyear TSO C80 fuel cells and are experiencing fuel leakage, you are asked to contact an airworthiness inspector at your nearest FAA District Office (FSDO or GADO) by April 1, 1978, if possible. A growing number of "Malfunction/Defect Reports" involving these fuel cells has prompted FAA to initiate a Directed Safety Investigation. The fuel cells under investigation are manufactured by Goodyear under their construction process numbers BTC 39 and BTC 67. Cell deterioration, resulting in fuel leakage, has been attributed to age, temperature, humidity conditions and possibly packaging creases in the bag material. Information gathered nationwide will be sent to FAA's Aeronautical Center in Oklahoma City for analysis.

KEEP IT CLEAN. FAA has published a new advisory circular for shops that repair and overhaul aircraft instruments, calling attention to the importance of conducting such work in a controlled environment because of the sensitivity of instrument parts to contaminents. Temperature, humidity and air quality are some of the important environmental factors. Calibrations of test equipment as well as the instruments is also discussed in AC 43-15, "Recommended Guidelines for Instrument Shops", free from FAA.

(Unless otherwise indicated, advisory circulars mentioned in this column are free from DOT/FAA Distribution Unit, TAD 443.1, Washington, D.C. 20590.)

DASTARDLY DUCKS. Resident flock of mallards at Sky Bryce (Va.) Airport have learned to block the path of departing aircraft until given a food handout by the airport manager. The wiley birds have made the mountain valley resort a year-around hangout.

AD Note Cautions Pilots on Operation of Cheyenne Flaps

An Emergency Airworthiness Directive has been issued by FAA cautioning pilots of Piper *Cheyenne* twins to be positive they understand the way their flap selection system works—specifically they should not try to change their minds about the flap setting too rapidly. The AD was issued following an incident in which a *Cheyenne* stalled and crashed during an engine-out go-round on a training flight.

The problem developed when the instructor asked for a go-around while the airplane was on final with full flaps. *Cheyenne* has three flap settings, "up", "approach" and "full down", and the student flipped the flap selector to "up". When the instructor suggested "approach" might be better the trainee immediately changed to that setting. At that point the flaps reversed direction and went back to "full down" but the busy pilots did not notice. The airplane lost airspeed, stalled and crashed shortly thereafter. Fortunately the occupants were not seriously hurt, but the airplane was badly damaged.

The AD, which is to be attached to the airplane flight manual or operating handbook, says *"Caution. When selecting an 'approach' flap position and the selector is inadvertently moved beyond the 'approach' detent, the selector must be returned to its original position and then back to 'approach' in order to reprogram the selector. Returning the selector to the 'approach' detent without reprogramming will return the flaps to their original position."* Piper has also issued a revision to the manual and handbook.

IA Rules are Changed

An aircraft airframe and powerplant (A & P) mechanic's inspection authorization ceases to be effective immediately if he loses either his airframe rating or powerplant rating, under a recent FAA rule change. Furthermore, he is not eligible to have his inspection authorization renewed until his A & P ratings have again been in effect for a *continuous three-year period.*

The regulatory action (amendment #65-22 to FAR Part 65) was the result of a 1973 proposal designed to clarify the rules governing authorized inspectors.

Airport Closings Predicted

Some 120 busy, privately-owned but open-to-the-public airports may close during the next ten years if solutions are not found for their financial and other problems, according to a recent FAA survey, which covered 293 of the busiest privately-owned airports still open for public use as well as 112 recently abandoned airports. FAA was directed by the Airport and Airway Development Act Amendments of 1976 to survey such airports to determine how many may close and report the findings to the congress.

Main reasons for the closings are financial, particularly high property taxes and the high cost of capital improvements and maintenance. The report suggests that the most effective measures for preventing airports from closing could be taken by state and local governments in the form of tax exemptions, zoning and other land-use controls, financial grants, and in some cases, public acquisition or maintenance.

Individual copies of the report "Potential Closure of Airports" are available free from DOT Publications Section, TAD 443.1, Washington, D.C. 20590.

Annual Reporting by Aircraft Owners No Longer Required

General aviation aircraft owners, who have been filling out annual forms to revalidate their aircraft registration and to report aircraft activity information, will not be receiving such forms in 1978. The annual revalidation requirement has been dropped by FAA in favor of a triennial (every three years) considered sufficient under present circumstances to maintain the accuracy of the Civil Aircraft Registry.

The annual reporting program went into effect in 1970 to purge the Registry of obsolete data, which has now been largely accomplished.

The form was also used as a means of gathering information about flying activity and equipment. This data will now be gleaned by a new "statistical sampling" procedure in which some 30,000 general aviation aircraft owners (about 14 percent of the total) will be queried via mailed questionnaires regarding data such as the hours flown, type of flying (business, personal, etc.) hours flown on instrument flight plans, state (not airport) where aircraft is based, and avionics equipment.

First of the questionnaires were mailed in February. To assure maximum response, persons not returning questionnaires will receive a follow-up form several weeks later, and finally efforts will be made to contact non-respondents by phone. Information gathered from the survey will be used solely as group statistics for planning and forecasting purposes.

Once follow-ups are finished, aircraft identification and owners' names will be deleted. Survey results are expected to be completed by mid-1978. (NOTE: This form is not to be confused with IRS aircraft use tax statement which remains unchanged, and still must be paid.)

G. A. Exhibit in Smithsonian

An early model of the Learjet 23—first jet-powered light aircraft to be designed and built for civil use in this country—will be displayed in the new general aviation exhibit, scheduled to open about April 1 at the National Air and Space Museum in Washington, D.C. The Learjet made the 1,246-mile trip from Wichita to Washington in two large tractor-trailers, then was reassembled and suspended from the ceiling of the Museum's new General Aviation Gallery, located in the southwest corner of the first floor of the building.

The second of the three airplanes on display in the new gallery is a Piper J-3 *Cub*, which was flown from Texas by the donor last spring (see FAA GENERAL AVIATION NEWS, page 14, May 1977). Third airplane is the Cessna 180 in which Jerry Mock became the first woman to fly around the world.

• For an Earlier Start

In the August 1977 issue you suggested some preparatory reading materials to a 15-year-old ". . . as you move closer to taking flying lessons." This eager youngster could not only be taking flying lessons now, but could have soloed on his 14th birthday and be building up much valuable experience at one of the excellent glider training sites in this country, including his home state. Please suggest that he contact the Soaring Society of America, Box 66071, Los Angeles, Calif. 90066.

Hal Bonney
Calimesa, Calif.

• Obstruction Lighting

Congratulations for putting out such a fine publication. I read every issue from A to Z.

Please tell me if there are any rules that require high towers or antennas to have some type of warning light on top. I have encountered two that do not have lights recently, and even though these obstructions are indicated on sectional charts, looking for them at low altitude—particularly in haze or smog—is quite difficult.

Jalal Mahdavian, M.D.
Kingston, N.Y.

The authority of FAA does not extend to ground objects, such as the towers you have encountered. In certain situations the Federal Communications Commission has jurisdiction over tower construction.

FAA does establish detailed obstruction marking and lighting standards, and while compliance with these standards is voluntary, cooperation from tower owners has been excellent.

Any unlighted towers should be reported to the nearest FAA Flight Service Station. FAA will check with the tower owner, and if necessary will issue appropriate notices to airmen (NOTAM's) and charting requirements. Copies of Advisory Circular 70/7460-1E, "Obstruction Marking and Lighting" are available free of charge from DOT/FAA Distribution Unit, TAD 443.1, Washington, D.C. 20590.

• Calling Mid-South Mechanics

Please tell your readers about the "Twelfth Annual Tennessee Mid-South General Aviation Maintenance Seminar", to be held at Nashville's Metropolitan Airport March 28, 29 and 30, 1978. The program offers the latest in general aviation maintenance information and techniques—much of it by industry representatives—and allows ample time for attendees to consult with technicians.

Full information on schedules and motel accommodations for this free seminar may be obtained by writing Tennessee DOT, Bureau of Aeronautics, P.O. Box 17326, Nashville, Tennessee, 37217.

H. P. Gassaway
Nashville, Tenn.

• Attention Good Buddies

The CB craze is a joy to millions of Americans and listening on the open road can be funnier than any radio show. Lately, however, CB jargon is entering aviation communications. I heard one pilot tell a controller that he'd been "stepped on" which to the CBer, means the tower transmission had been blocked by another transmission. I've also heard the terms "10-4" and "What's your 10-20?" being used instead of "Roger" and "Say your position."

The very thing that makes the CB interesting —the variety of expressions—is the thing that will do the most harm in aviation communications. In aviation, it is not only important that the two persons conversing understand each other, but that everyone monitoring the conversation understand it, too—and quickly, in the interest of safety.

Positive corrective action is needed immediately, and unfortunately neither FCC nor FAA is in a position to do it. The only solution is for the aviation public at the small airport to police itself, correcting abusers whenever possible.

English is the international aviation language. It is folly to distort it any more than the many English-speaking countries do now.

Dan Keenan
Washington, D.C.

• Publications: How to Get Them

I am a subscriber to FAA GENERAL AVIATION NEWS, so I get it every month. However, I have been unable to find out how to get copies, on a regular basis of FAA Accident Prevention leaflets, such as GL Form 8000-3.23 (9-76) and others. One such publication, on the correct use of rudder in conjunction with ailerons has been very helpful to me.

Oliver Smithies
Madison, Wis.

There are numerous very helpful publications that are distributed via the FAA Accident Prevention Program; frequently they are handed out at safety seminars. Some of these come from FAA Headquarters, but many originate in the regional or district offices. We suggest you contact the Accident Prevention Specialist at the nearest FAA GADO. He will be able to advise you on getting copies of the above, and he can also direct you to seminars in your area, where you will find not only newly issued Accident Prevention publications, but also interesting safety programs.

• The Killer Stall

I have been flying light planes since January 1947, and I am deeply concerned about the fatal accidents that result from what I call the "killer stall." I know of at least three crashes that happened this way. Two of the pilots I regarded as good pilots, with many hours of experience and a vast knowledge of flying, but apparently they just did not recognize those killer stalls in time.

One pilot was trying to stretch his glide so that he might put down on the edge of a lake after his engine stopped for some reason. When he stalled and crashed into a house all three people in the airplane were killed. Another pilot stalled 150 feet above the runway during a steep climb after takeoff.

I wish there were something I could say to make pilots pay more attention to their airspeed during takeoffs and landings. Most killer stalls would then be eliminated. I hope your readers won't regard me as a know-it-all pilot. It's just that I want to end these needless crashes from low altitude stalls, which seem to sneak up on so many. Pilots, please pay more attention.

Lenny Day
Raymond, N.H.

FAA GENERAL AVIATION NEWS welcomes comments from our readers. No anonymous letters will be used, but names will be withheld on request. Address: FAA GENERAL AVIATION NEWS, AFS-807, Washington, D.C. 20591.

• More Acrobatics, Please

I have enjoyed your publication for several years and have found it most useful both for keeping me up to date on safety tips and for expanding my knowledge of aviation. The July issue was particularly interesting for its article on acrobatics. I do no acrobatic flying, but it increased my understanding especially of the maneuvers involved. For the first time I now know what a "split S" is.

I would like to suggest a feature article which would diagram and explain all the various maneuvers. Although I realize that the magazine is primarily directed to safety measures, I know that many pilots would be interested.

W. C. Lanham
Birmingham, Ala.

If other readers are interested, we will prepare such an article.

INSTRUMENT CORNER

• Simulator Command Time

In a recent Forum you stated that you may log as pilot-in-command "any flight time during which you are the sole manipulator of the controls of an aircraft for which you are rated." Is this limited to aircraft, or does it also apply to instruction received in an acceptable instrument ground trainer?

Also, regarding altimeter settings. I have heard two different opinions on proper IFR preflight procedure. Please clarify. If the altimeter setting given by tower, ATIS or whatever, results in your altimeter reading *other* than field elevation (an error of less than 50 feet) should you change the setting so it reads the field elevation, or leave it at the setting given?

Charles M. Olsen
Kemah, Tex.

The logging of pilot-in-command time is limited to flight time in an aircraft. Instruction in an instrument ground trainer should be logged as instrument ground trainer instruction and must be certified by the instructor who gives it. (However, ground trainer time can be included as part of the required "flight" time for certain certificates and ratings.)

Regarding the altimeter, put the setting that is reported by the tower or ATIS into the window on the instrument. Since altimeter errors are not necessarily consistent at all altitudes, changing the setting so the altimeter reads the field elevation could result in a compounded error in the air. Furthermore, according to FAA's "Instrument Flying Handbook" if the reading on the altimeter is more than 75 feet different than the known field elevation, "the accuracy of the altimeter is questionable and the problem should be referred to an appropriately rated repair station for evaluation and possible correction."

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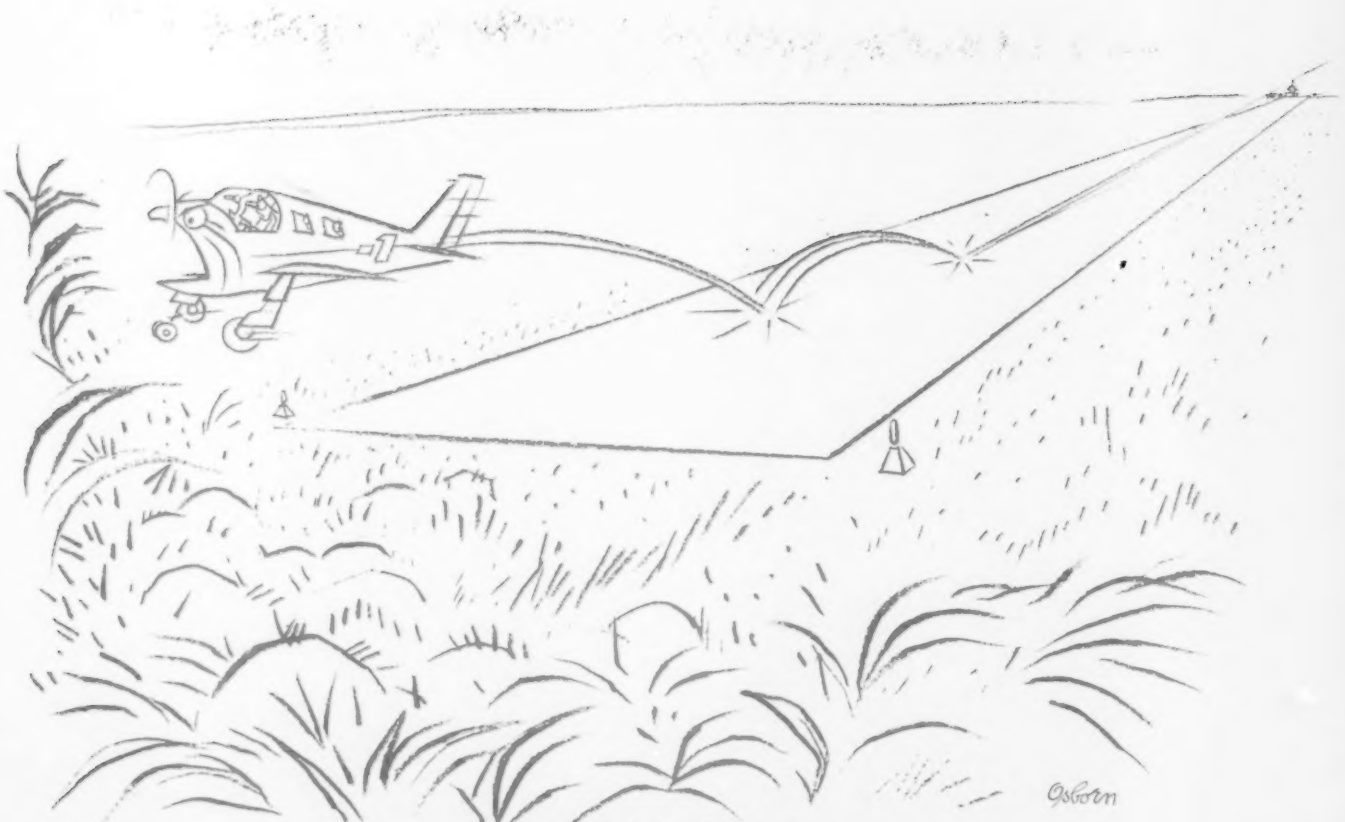

Is the stitch that saves nine